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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/782,367	02/19/2004	Paul A. Hoisington	09991-121001 / 422	3570

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EXAMINER

MRUK, GEOFFREY S

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/782,367

Applicant(s)

HOISINGTON ET AL. 

Examiner

Geoffrey Mruk

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 15-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 21 May 2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Claims 15-39 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 24 June 2005.

Specification

The abstract of the disclosure is objected to because it lacks a descriptive statement for the technical disclosure. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 4, 6, 8, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Tracy et al. (US 5,808,643).

With respect to claim 1, Tracy discloses a drop ejection device (Column 1, line 5), comprising:

- a flow path (Fig. 1, element 36) in which fluid is pressurized (Column 3, lines 31-54) for ejecting a drop from a nozzle opening (Fig. 1, element 27), and

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- a deaerator (Fig. 3) including a fluid reservoir region (Fig. 3, element 38),
- a vacuum region (Fig. 3, elements 22, "To vacuum"), and
- a partition (Fig. 3, wall of element 22) between the fluid reservoir region and the vacuum region, the partition including a wetting layer (Fig. 3, outside surface of element 22) and a non-wetting layer (Fig. 3, inside surface of element 22) and
- one or more channels (Fig. 4) extending through the wetting and non-wetting layers, wherein
- the wetting layer is exposed to the fluid reservoir region (Column 4, lines 38-65).

With respect to claim 3, Tracy discloses the one or more channels are through-holes (Column 5, lines 45-48, i.e. gas permeable membrane).

With respect to claim 4, Tracy discloses the flow path (Fig. 1, element 36) and the deaerator (Fig. 3) are in a silicon material body (Fig 1, element 14, Column 2, lines 56-57).

With respect to claim 6, Tracy discloses the wetting layer is a silicon material (Column 4, line 67).

With respect to claim 8, Tracy discloses the non-wetting layer is a polymer (Column 4, line 67).

With respect to claim 14, Tracy discloses the device includes a plurality of fluid paths and a plurality of corresponding deaerators (Column 5, lines 61-64).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 2, 5, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tracy et al. (US 5,808,643) in view of Moynihan (US 4,947,184).

With respect to claim 2, Tracy discloses one or more channels having a width (Fig. 4, element 22').

However, Tracy fails to disclose the channels having a width of about 0.1 micron to about 5 microns.

With respect to claim 5, Tracy discloses a wetting layer (Fig. 3, outside surface of element 22).

However, Tracy fails to disclose the wetting layer has a surface energy of about 40 dynes/cm or more.

With respect to claim 11, Tracy discloses the wetting layer has a thickness (Column 4, lines 51-54, i.e. the ink contacts the outer surface of the tubing member).

However, Tracy fails to disclose the wetting layer has a thickness of about 25 microns or less.

Moynihan discloses elimination of nucleation sites in a pressure chamber for ink jet systems where

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- “At the other end of the pressure chamber 18, the stiffener plate has an aperture 21 which may be, for example, about 5 to 10 mils in diameter” (Column 2, lines 60-62),
- “Other polymeric materials suitable for use with conventional hot melt inks or other inks having a surface energy less than the coating material include polyvinylidene chloride (40 dynes/cm)” (Column 4, lines 12-20), and
- “A pressure chamber wherein the coating on the wall segments is between about 0.1 and about 5 microns thick” (Claim 2).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the teachings of Moynihan on the tubing member disclosed by Tracy. The motivation for doing so would have been “a new and improved ink jet system having a pressure chamber arranged to inhibit formation of air bubbles therein” (Column 1, lines 11-13).

2. Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tracy et al. (US 5,808,643) in view of Fujimura et al. (US 4,751,532).

With respect to claim 7, Tracy discloses a non-wetting layer (Fig. 3, inside surface of element 22).

However, Tracy fails to disclose the non-wetting layer has a surface energy of about 25 dynes/cm or less.

Fujimura discloses a thermal electrostatic ink-jet recording head where “After masking, a silicon fluoride coating agent KE-801 (made by Shinetsu Chemical Industry Co., Ltd.) having a thickness of 1 μ m was applied to the entire end surfaces 10a and 12a

of the plate members 10 and 12. The photoresist mask was removed by etching, so that the respective low surface energy treatment areas 24 and 26 extending to within 50 μm of the respective slit edges were completed. The critical surface tension of the thus treated surface of the plate was 16 dyne/cm and the critical surface tension of the non-treated surface of the plate was 50 dyne/cm, as measured using a plotting method" (Column 6, lines 23-34).

At the time of the invention, it would have been obvious for one of ordinary skill in the art to use the teachings of Fujimura on the tubing member disclosed by Tracy. The motivation for doing so would have been "stable and good quality printing could be repeatedly attained" (Column 6, lines 37-38).

3. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tracy et al. (US 5,808,643) in view of Cai et al. (US 6,457,820 B1).

With respect to claim 9, Tracy discloses the non-wetting layer is a polymer (Column 4, line 67).

However, Tracy fails to disclose the polymer used for the non-wetting layer is a fluoropolymer.

Cai discloses a method for removing gas bubbles for an ink jet printer where "The film of the preferred embodiment is a nonporous film formed of either Poly dimethyl silicone (PDMS) or Polytetra fluoro ethylene (PTFE) (sold commercially under the trade name of Teflon AF®) and has a thickness of 3-15 microns" (Column 2, lines 58-61).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the method for removing gas bubbles taught by Cai in the tubing member

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disclosed by Tracy. The motivation for doing so would have been "Given the above specifications, at a pressure differential of 10 cm Hg, the film may transmit up to 1.34×10^{-2} cc/second. Other nonporous air-permeable films known in the art may also be used" (Column 3, lines 1-4).

4. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tracy et al. (US 5,808,643) in view of Nishiwaki et al. (US 5,125,969).

With respect to claim 12, Tracy discloses a drop ejection device (Column 3, lines 31-54).

However, Tracy fails to disclose a drop ejection device includes a piezo electric actuator.

Nishiwaki discloses an ink jet recording method where "Various types of ink jet recording methods are known. Typical examples include: an ink jet recording method in which a portion of the charged droplets which are generated in sequence are used for recording; an ink jet recording method in which a signal is supplied to a recording head incorporating a piezoelectric element so that a droplet of a recording liquid can be generated in response to the signal supplied for recording; and an ink jet recording method in which thermal energy is applied to a recording liquid contained in a chamber of a recording head in accordance with a recording signal" (Column 1, lines 22-33).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the ink jet recording method disclosed by Nishiwaki in the ink jet printer disclosed by Tracy. The motivation for doing so would have been "so that a droplet of a

recording liquid can be generated in response to the signal supplied for recording”
(Column 1, lines 28-29).

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tracy et al. (US 5,808,643) in view of Bentin (US 4,413,268).

With respect to claim 13, Tracy discloses a drop ejection device (Column 3, lines 31-54) with nozzle openings (Fig. 2, element 27).

However, Tracy fails to disclose the nozzle opening has a width of about 200 microns or less.

Bentin discloses jet nozzles for an ink jet printer where “The diameter d of the jet nozzle 2 is approximately 50 μ m” (Column 4, line 1).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the jet nozzle structure disclosed by Bentin in the ink jet printer disclosed by Tracy. The motivation for doing so would have been “The invention has for its object to provide a construction of the nozzles of a jet nozzle printer in which the ink droplets are individually ejected for a free, unaffected flight, the ink droplets being ejected uniformly and always in the direction of the axis of the nozzle” (Column 2, lines 59-63).

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Geoffrey Mruk whose telephone number is (571) 272-2810. The examiner can normally be reached on 7am - 330pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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8/19/2005

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8/22/05
MANISH S. SHAH
PRIMARY EXAMINER